

*If you are using a printed copy of this procedure, and not the on-screen version, then you **MUST** make sure the dates at the bottom of the printed copy and the on-screen version match. The on-screen version of the Collider-Accelerator Department Procedure is the Official Version. Hard copies of all signed, official, C-A Operating Procedures are kept on file in the C-A ESHQ Training Office, Bldg. 911A*

C-A OPERATIONS PROCEDURES MANUAL

ATTACHMENT

4.120.72.j LINAC Laser Interlock Systems Tests

C-A-OPM Procedures in which this Attachment is used.		
4.120.72		

Hand Processed Changes

<u>HPC No.</u>	<u>Date</u>	<u>Page Nos.</u>	<u>Initials</u>
_____	_____	_____	_____
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Approved: *Signature on File* _____
 Collider-Accelerator Department Chairman _____ Date

V. Castillo

4.120.72.j LINAC Laser Interlock Systems Tests

PASS ANNUAL ACCEPTANCE TEST PROTOCOL

Division A Software Filename and Checksum: Title: _____ Checksum: _____

Division B Software Filename and Checksum: Title: _____ Checksum: _____

Initial testing complete:

Test Team Leader's Name (Print): _____ Life Number: _____

Test Team Leader's Name (Sign): _____ Date: ____/____/____

Acceptance test procedure complete (following repairs and retesting if required):

Test Team Leader's Name (Print): _____ Life Number: _____

Test Team Leader's Name (Sign): _____ Date: ____/____/____

Test results reviewed by:

Safety Section Head's Name (Print): _____ Life Number: _____

Safety Section Head's Name (Sign): _____ Date: ____/____/____

Test results accepted by Radiation Safety Committee:

RSC Member's Name (Print): _____ Life Number: _____

RSC Member's Name (Sign): _____ Date: ____/____/____

WARNING:
The LINAC Laser Beam Output Must Be LOTO'ed By A Laser System Operator Prior To Entry Of The Laser Areas By Test Personnel

1.1 Test of LINAC Laser Interlock System with laser OFF

- | | | | |
|--------------------------|----------------|---|----------------|
| <input type="checkbox"/> | VERIFY | LINAC Laser Beam Output is | LOTO'ed |
| | CLOSE | Double Doors (DD) | |
| <input type="checkbox"/> | VERIFY | DD are | CLOSED |
| | STATION | One person in the Laser room | |
| | START | Timer / Laser Reset (T/LR) with ME8 key at encl 5874 outside laser room | |
| <input type="checkbox"/> | VERIFY | At encl 5874 Time Delay Light (TDL) is | ON |
| <input type="checkbox"/> | VERIFY | At encl 5874 Laser Enabled / Door Reset (LE/DR) light is | ON |
| <input type="checkbox"/> | VERIFY | At laser, Laser Ready amber light (LRAL) is | ON |
| | WAIT | 10 secs | |
| <input type="checkbox"/> | VERIFY | TDL is | OFF |
| <input type="checkbox"/> | VERIFY | LE/DR light is still | ON |
| <input type="checkbox"/> | VERIFY | LRAL is | ON |
| | OPEN | North DD | |
| <input type="checkbox"/> | VERIFY | LE/DR light is | OFF |
| <input type="checkbox"/> | VERIFY | At laser, LRAL is | OFF |
| | CLOSE | North DD | |
| | START | T/LR with ME8 key at encl 5874 | |
| <input type="checkbox"/> | VERIFY | TDL <input type="checkbox"/> and LE/DR <input type="checkbox"/> are | ON |
| | ENTER | DD in < 10 secs and close door | |
| <input type="checkbox"/> | VERIFY | Up to < 10 secs TDL is | ON |
| <input type="checkbox"/> | VERIFY | LE/DR light is still | ON |
| <input type="checkbox"/> | VERIFY | At laser, LRAL is | ON |
| | OPEN | North DD and hold open | |
| <input type="checkbox"/> | VERIFY | LE/DR light is | OFF |
| <input type="checkbox"/> | VERIFY | At laser, LRAL is | OFF |
| | CLOSE | North DD | |
| | SETUP | To test South DD with North DD closed | |
| | HOLD | South DD MS | CLOSED |
| | START | T/LR with ME8 key at encl 5874 | |
| <input type="checkbox"/> | VERIFY | At encl 5874 TDL is | ON |
| <input type="checkbox"/> | VERIFY | At encl 5874 LE/DR light is | ON |
| <input type="checkbox"/> | VERIFY | At laser, LRAL is | ON |
| | WAIT | 10 secs | |
| <input type="checkbox"/> | VERIFY | TDL is | OFF |
| <input type="checkbox"/> | VERIFY | LE/DR light is still | ON |
| <input type="checkbox"/> | VERIFY | LRAL is | ON |
| | OPEN | South DD MS | |
| <input type="checkbox"/> | VERIFY | LE/DR light is | OFF |

<input type="checkbox"/>	VERIFY	At laser, LRAL is	OFF
	CLOSE	South DD microswitch (MS)	
	START	T/LR with ME8 key at encl 5874	
<input type="checkbox"/>	VERIFY	TDL <input type="checkbox"/> and LE/DR <input type="checkbox"/> are	ON
	OPEN	South DD MS for < 10 secs then close South DD MS	
<input type="checkbox"/>	VERIFY	Up to < 10 secs TDL is	ON
<input type="checkbox"/>	VERIFY	LE/DR light is still	ON
<input type="checkbox"/>	VERIFY	At laser, LRAL is	ON
	OPEN	Left DD MS and hold open	
<input type="checkbox"/>	VERIFY	LE/DR light is	OFF
<input type="checkbox"/>	VERIFY	At laser, LRAL is	OFF
	CLOSE	South DD	
	START	T/LR with Push Button (PB) at encl 5875 inside laser room	
<input type="checkbox"/>	VERIFY	At encl 5875 TDL is	ON
<input type="checkbox"/>	VERIFY	At encl 5875 LE/DR light is	ON
<input type="checkbox"/>	VERIFY	At laser, LRAL is	ON
	WAIT	10 secs	
<input type="checkbox"/>	VERIFY	TDL is	OFF
<input type="checkbox"/>	VERIFY	LE/DR light is still	ON
<input type="checkbox"/>	VERIFY	LRAL is	ON
	OPEN	North DD	
<input type="checkbox"/>	VERIFY	LE/DR light is	OFF
<input type="checkbox"/>	VERIFY	At laser, LRAL is	OFF
	CLOSE	North DD	
	START	T/LR with PB at encl 5875	
<input type="checkbox"/>	VERIFY	TDL <input type="checkbox"/> and LE/DR <input type="checkbox"/> are	ON
	EXIT	North DD in < 10 secs and close door	
<input type="checkbox"/>	VERIFY	Up to < 10 secs TDL is	ON
<input type="checkbox"/>	VERIFY	LE/DR light is still	ON
<input type="checkbox"/>	VERIFY	At laser, LRAL is	ON
	OPEN	North DD and hold open	
<input type="checkbox"/>	VERIFY	LE/DR light is	OFF
<input type="checkbox"/>	VERIFY	At laser, LRAL is	OFF
	CLOSE	North DD	
	SETUP	To test South DD with North DD closed	
	HOLD	South DD MS	CLOSED
	START	T/LR with Push Button (PB) at encl 5875 inside laser room	
<input type="checkbox"/>	VERIFY	At encl 5875 TDL is	ON
<input type="checkbox"/>	VERIFY	At encl 5875 LE/DR light is	ON
<input type="checkbox"/>	VERIFY	At laser, LRAL is	ON
	WAIT	10 secs	
<input type="checkbox"/>	VERIFY	TDL is	OFF
<input type="checkbox"/>	VERIFY	LE/DR light is still	ON
<input type="checkbox"/>	VERIFY	LRAL is	ON
	OPEN	South DD MS	
<input type="checkbox"/>	VERIFY	LE/DR light is	OFF
<input type="checkbox"/>	VERIFY	At laser, LRAL is	OFF

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|--------------------------|---------------|--|------------|
| | CLOSE | South DD MS | |
| | START | T/LR with PB at encl 5875 | |
| <input type="checkbox"/> | VERIFY | TDL <input type="checkbox"/> and LE/DR <input type="checkbox"/> are | ON |
| | OPEN | South DD MS for < 10 secs then close South DD MS | |
| <input type="checkbox"/> | VERIFY | Up to < 10 secs TDL is | ON |
| <input type="checkbox"/> | VERIFY | LE/DR light is still | ON |
| <input type="checkbox"/> | VERIFY | At laser, LRAL is | ON |
| | OPEN | South DD MS and hold open | |
| <input type="checkbox"/> | VERIFY | LE/DR light is | OFF |
| <input type="checkbox"/> | VERIFY | At laser, LRAL is | OFF |
| | CLOSE | DD | |
- ☐ **Check for acceptance of Test of LINAC Laser Interlock System with laser OFF**

1.2 Test of LINAC Laser Interlock System with laser ON

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|--------------------------|---------------|--|---------------|
| | START | T/LR with ME8 key at encl 5874 | |
| <input type="checkbox"/> | VERIFY | At encl 5874 TDL is | ON |
| <input type="checkbox"/> | VERIFY | At encl 5874 LE/DR light is | ON |
| <input type="checkbox"/> | VERIFY | At laser, LRAL is | ON |
| | HAVE | Operator Turn ON LINAC Laser | |
| <input type="checkbox"/> | VERIFY | LINAC Laser Pulsing Light Indicator (PLI) is | ON |
| | OPEN | North DD from inside for > 10secs, keeping the South DD closed | |
| <input type="checkbox"/> | VERIFY | LE/DR light is | OFF |
| <input type="checkbox"/> | VERIFY | At laser, LRAL is | OFF |
| <input type="checkbox"/> | VERIFY | LINAC Laser PLI is | OFF |
| <input type="checkbox"/> | VERIFY | Attempt to turn ON LINAC Laser | FAIL |
| | CLOSE | North DD | |
| <input type="checkbox"/> | VERIFY | At laser, LRAL is | OFF |
| <input type="checkbox"/> | VERIFY | Attempt to turn ON LINAC Laser | FAIL |
| | SETUP | To test South DD with North DD closed | |
| | HOLD | South DD MS | CLOSED |
| | START | T/LR with ME8 key at encl 5874 | |
| <input type="checkbox"/> | VERIFY | At laser, LRAL is | ON |
| | HAVE | Operator Turn ON LINAC Laser | |
| <input type="checkbox"/> | VERIFY | LINAC Laser PLI is | ON |
| | OPEN | South DD MS and hold open >10 secs | |
| <input type="checkbox"/> | VERIFY | LE/DR light is | OFF |
| <input type="checkbox"/> | VERIFY | At laser, LRAL is | OFF |
| <input type="checkbox"/> | VERIFY | LINAC Laser is | OFF |
| <input type="checkbox"/> | VERIFY | Attempt to turn ON LINAC Laser | FAIL |
| | CLOSE | South DD MS and hold closed | |
| <input type="checkbox"/> | VERIFY | At laser, LRAL is | OFF |

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|--------------------------|---|--|-------------------|
| <input type="checkbox"/> | VERIFY | Attempt to turn ON LINAC Laser | FAIL |
| | START | T/LR with PB at encl 5875 | |
| <input type="checkbox"/> | VERIFY | At encl 5875 TDL <input type="checkbox"/> and LE/DR <input type="checkbox"/> are | ON |
| <input type="checkbox"/> | VERIFY | At laser, LRAL is | ON |
| <input type="checkbox"/> | VERIFY | Attempt to turn ON LINAC Laser | SUCCESSFUL |
| | Turn OFF | LINAC laser | |
| <input type="checkbox"/> | VERIFY | LINAC Laser is | OFF |
| <input type="checkbox"/> | Check for acceptance of Test of LINAC Laser Interlock System with laser ON | | |

END OF TEST PROCEDURE

TTL: Sign for completion of initial testing: _____

Date: ____/____/____

TTL: Sign for completion of final testing: _____

Date: ____/____/____